

Roncus satoi, a New Pseudoscorpion Species from the Balkan Peninsula (Arachnida: Pseudoscorpiones: Neobisiidae)

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Abstract A new species, *Roncus satoi* ĆURČIĆ et DIMITRIJEVIĆ (Arachnida: Pseudoscorpiones: Neobisiidae), is described from southwestern Serbia, Yugoslavia. It is illustrated and compared with its nearest known congener, *R. strahor* ĆURČIĆ, from southeastern Serbia (Yugoslavia). Notes are given on habitats, distributions, characters, and future studies of *Roncus* species.

The genus *Roncus* L. KOCH, 1873, was erected for the species *R. lubricus* L. KOCH, 1873, now known from the United Kingdom, France, and Belgium (GARDINI, 1983; ĆURČIĆ, 1992; ĆURČIĆ *et al.*, 1992). The majority of representatives of this genus inhabit southern Europe, the main distribution centres being the Iberian Peninsula, the Apennines, and the Balkan Peninsula (HARVEY, 1990). In Serbia (Yugoslavia), which occupies the northern and central areas of the Balkan Peninsula, 14 species of *Roncus* are presently known (ĆURČIĆ *et al.*, 1994); almost all of them are relicts, endemic to the area.

In this study, material from a sample of pseudoscorpions, collected in 1993 is examined; specimens studied from the village of Pazarište, near Novi Pazar, southwestern Serbia (Yugoslavia), belong to a new epigeal species: *Roncus satoi* sp. nov., which is described below based on the series of 8 individuals (2 females, 5 males, and 1 tritonymph).

Neobisiidae CHAMBERLIN, 1930

Roncus satoi ĆURČIĆ et DIMITRIJEVIĆ, sp. nov.

(Figs. 1–27; Table 1)

Etymology. This species is named after Dr. Hidebumi SATO, who greatly contributed to the knowledge of Japanese pseudoscorpions.

Specimens examined. Holotype male, 4 paratype males, allotype female, 1 paratype female, and 1 paratype tritonymph, from (oak and beech) leaf litter and humus, village of Pazarište, near Novi Pazar, Serbia, Yugoslavia; May–June 1993, Hilmija BEJTOVIĆ coll.

Description. Carapace somewhat longer than broad (Figs. 1, 12 & 21). Epistome triangular and pointed or slightly blunt apically (Figs. 10, 13 & 22). Eyes well-developed. Setal formulae: $4+5+2+4+2+6=23$, and $4+6+2+4+2+6=24$ (female), and $4+6+2+4+2+5=23$, $4+6+2+4+2+7=25$ (male), and $4+6+$

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$2+4+2+6=24$ setae. The basic pattern is, probably, $4+6+2+4+2+6=24$ setae.

Tergite I with 6 setae (adult, tritonymph), tergite II with 7–10 (adult) and 9 setae (tritonymph), tergites III–X each with 9–12 setae (adult, tritonymph). Male genital area (Fig. 15): sternite II with a cluster of 11–15 setae medially and posteriorly. Of these, 7–10 longer setae along posterior sternal border and 4–6 shorter setae mid-posteriorly, thinning out anteriorly. Sternite III with 4 (rarely 3) anterior and median setae, 8–11 posterior setae, and 3 microsetae along each stigma. Sternite IV with 8–10 marginal setae and 2 or 3 small suprastigmal microsetae on each side. Female genital area (Fig. 11): sternite II with 10 or 11 setae, in the form of a transverse patch; sternite III with 13 or 14 posterior setae and 2 or 3 microsetae along each stigma. Sternite IV with 10 or 11 setae and 2 or 3 suprastigmatic setae on each side. Tritonymph: sternite II with 2 setae, sternite III with 8 posterior setae and 2 microsetae along each stigma, and sternite IV with 7–9 marginal setae and 2 microsetae along each stigma. Sternites V–X each with 12–15 (adult), and with 13 or 14 setae (tritonymph).

Cheliceral spinneret (galea) low and rounded (Figs. 4, 14 & 23). Cheliceral palm with 6, movable finger with one seta (both in adult and tritonymph). Cheliceral dentition as in Figs. 4, 14 and 23. Flagellum 8– (female), 7– or 8– (male), and 7–bladed (tritonymph) (1 short proximal blade and 6 or 7 longer blades distally, all blades denticulate).

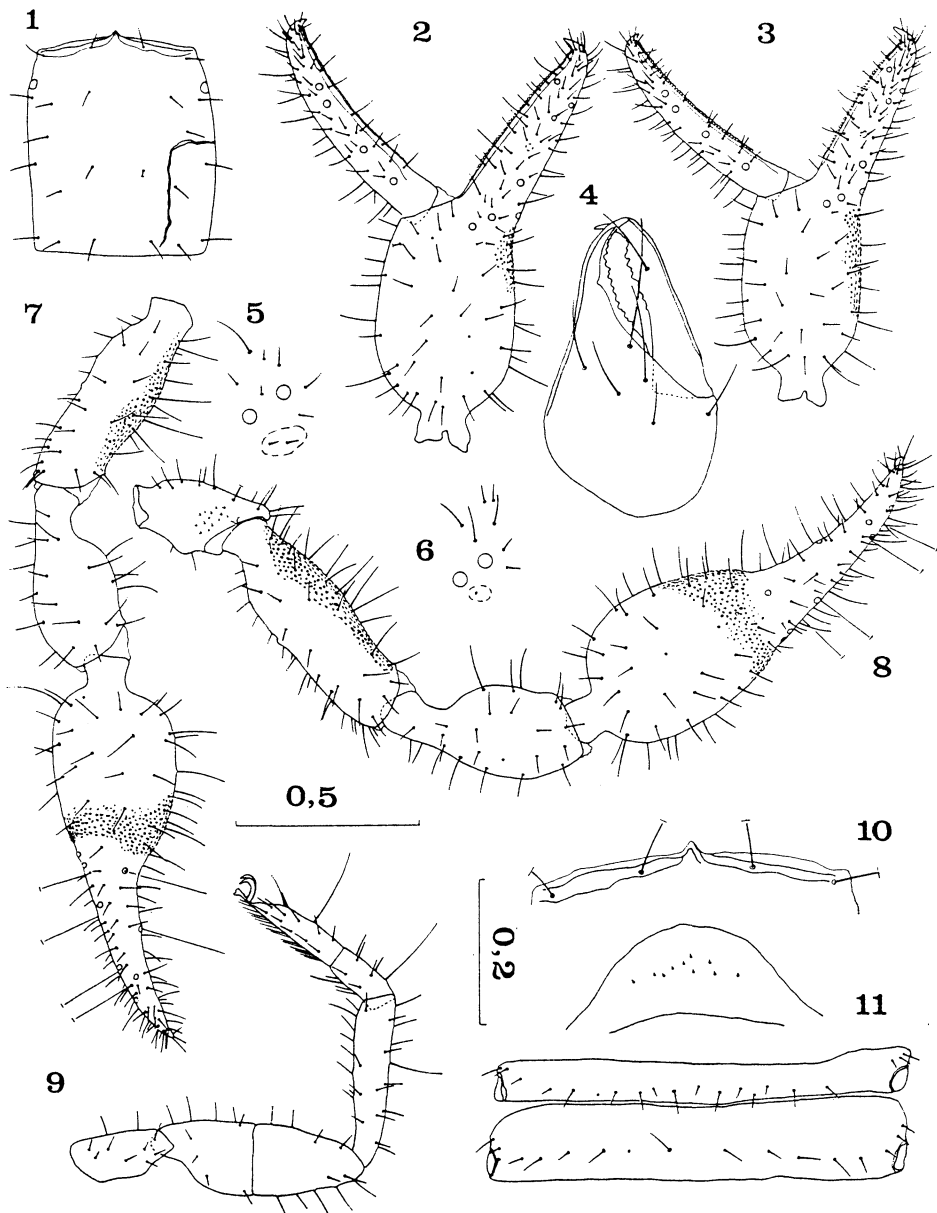
Apex of pedipalpal coxa with 4 (adult) or 3 long setae (tritonymph). Pedipalpal trochanter with some rare and inconspicuous denticulations dorsally. Pedipalpal femur with a small exterior and lateral tubercle, and with interior and dorsal granulations (Figs. 7, 8, 16, 17 & 26). Tibia smooth; chelal palm with exterior, dorsal, and interior granulations. With 1–4 (adult) or no microsetae (tritonymph) proximal to, and with some small setae distal to *eb* and *esb* (both adult and tritonymph; Figs. 5, 6, 19 & 25). A single tubercle present on the laterodistal side of chelal palm. In both sexes, sensillum located between 16th and 24th teeth (slightly distal to, or at the level of *sb*). The trichobothrium *ist* equidistant from *isb* and *est*, or slightly closer to *isb* than to *est* (Figs. 2, 3, 18 & 24). Fixed chelal finger with 48–50 (female), 56–61 (male) and 45 teeth (tritonymph). Movable chelal finger with 56 or 57 (female), 57–63 (male), and 42 teeth (tritonymph). The number of teeth on the movable chelal finger is greater (adult) or smaller (tritonymph) than on the fixed chelal finger.

Chelal fingers slightly (female, tritonymph) or distinctly longer than chelal palm (male) and shorter than pedipalpal femur (Table 1). Pedipalpal femur longer than (female, male), equal to (male), or slightly shorter than carapace (male, tritonymph) (Table 1). Trichobothriotaxy as in Figs. 2, 3, 18 and 24.

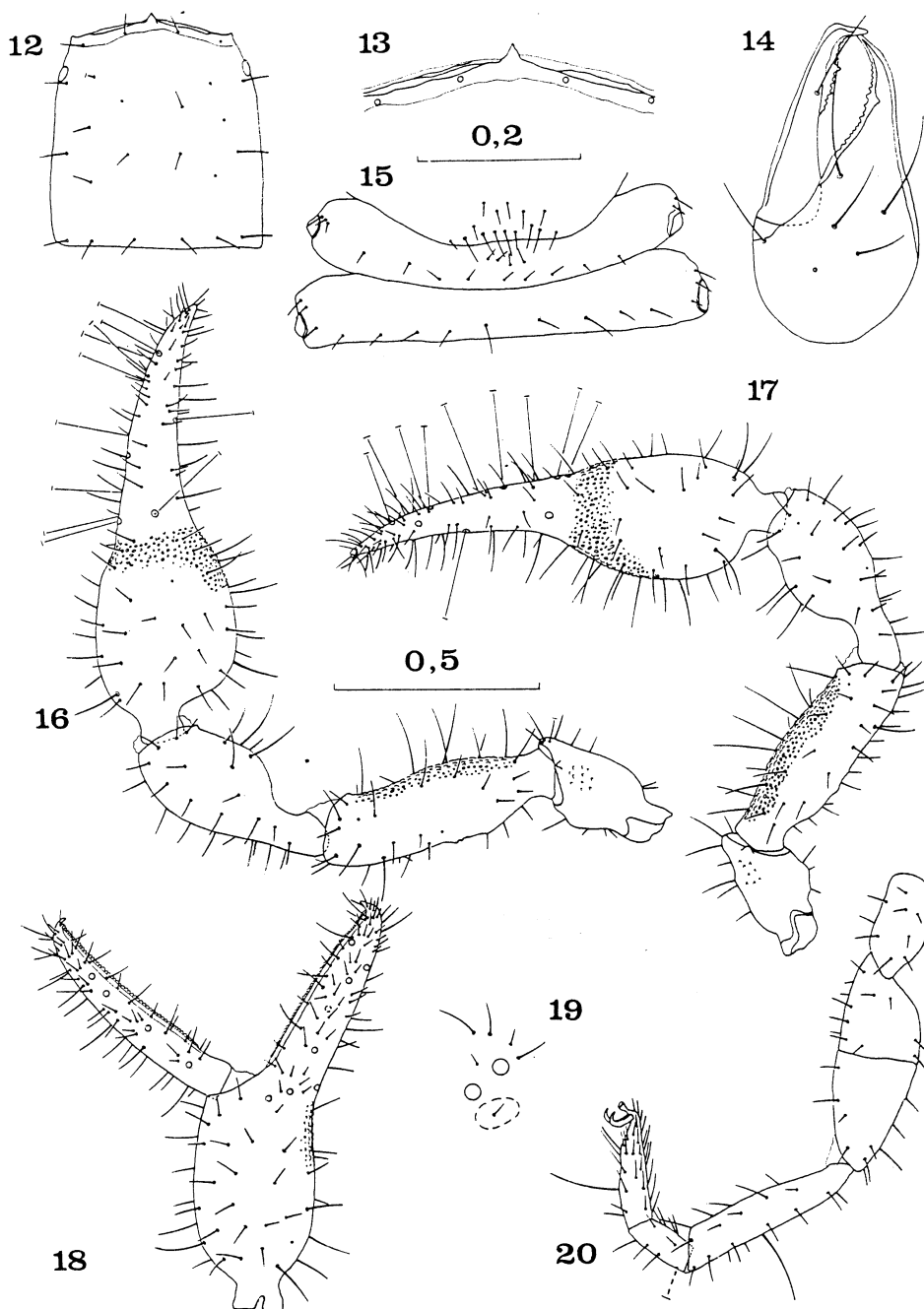
Tibia IV, basitarsus IV, and telotarsus IV each with a single tactile seta (Figs. 9, 20 & 27). Tactile seta ratios are presented in Table 1.

Distribution. Serbia (Yugoslavia), epigeal (in leaf litter, humus, and soil); probably endemic species.

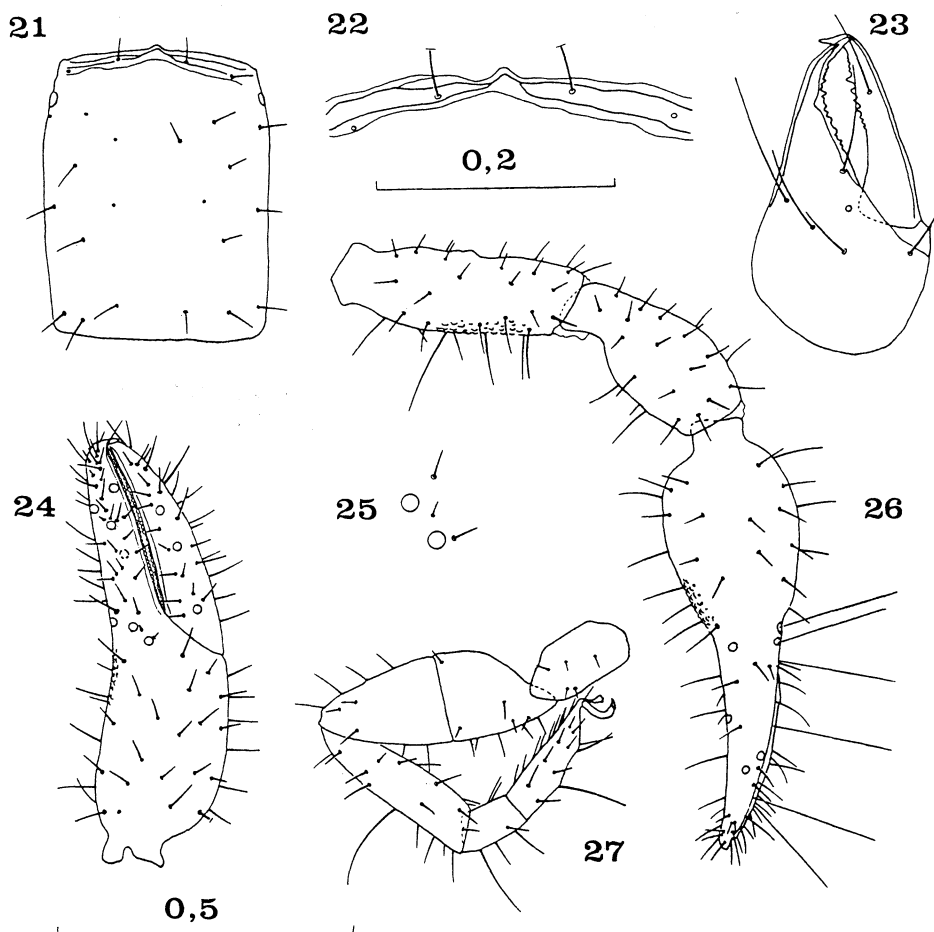
Remarks. From *R. pannoniensis* ČURČIĆ, DIMITRIJEVIĆ et KARAMATA, 1992, inhabiting northern and western Serbia (ČURČIĆ, 1992), *R. satoi* sp. nov. is easily distinguished by the presence/absence of extero-lateral and dorsal granulations on the chelal palm (present vs. absent), by the carapace length (0.72–0.88 mm in females



Figs. 1-11. *Roncus satoi* sp. nov., from Serbia, Yugoslavia.—1, Carapace, allotype female; 2, pedipalpal chela, paratype female; 3, pedipalpal chela, paratype female; 4, chelicera, paratype female; 5, microsetae proximal to *eb-esb*, allotype female; 6, microsetae proximal to *eb-esb*, paratype female; 7, pedipalp, allotype female; 8, pedipalp, paratype female; 9, leg IV, allotype female; 10, epistome, paratype female; 11, genital area, paratype female. Scales in mm.



Figs. 12-20. *Roncus satoi* sp. nov., from Serbia, Yugoslavia.—12, Carapace, holotype male; 13, epistome, holotype male; 14, chelicera, holotype male; 15, genital area, paratype male; 16, pedipalp, paratype male; 17, pedipalp, paratype male; 18, pedipalpal chela, holotype male; 19, microseta proximal to *eb-esb*, holotype male; 20, leg IV, holotype male. Scales in mm.



Figs. 21–27. *Roncus satoi* sp. nov., paratype tritonymph, from Serbia, Yugoslavia. —21, Carapace; 22, epistome; 23, chelicera; 24, pedipalpal chela; 25, microsetae distal to *eb-esb*; 26, pedipalp; 27, leg IV. Scales in mm.

and 0.72–0.81 mm in males *vs.* 0.59–0.64 mm in females and 0.58–0.59 mm in males), by the pedipalpal length of males (3.51–3.89 mm *vs.* 3.105–3.325 mm), by the leg IV length (2.67–2.84 mm in females and 2.56–2.775 mm in males *vs.* 2.27–2.41 mm in females and 2.185–2.255 mm in males), by the femur IV length (0.69–0.74 mm in females and 0.66–0.72 in males *vs.* 0.59–0.63 mm in females and 0.55–0.59 mm in males), by the form of the chelal palm of females (ovate *vs.* almost globular), and by the body size (greater *vs.* smaller).

R. satoi sp. nov. is easily distinguished from *R. trojan* ĆURČIĆ, 1993, from eastern Serbia, by the presence/absence of dorsal granulations on the pedipalpal chelae (present *vs.* absent), by the pedipalpal femur length of females (0.68–0.70 mm *vs.* 0.73–0.795 mm), by the chelal finger length of females (0.62–0.65 mm *vs.* 0.69–

Table 1. Linear measurements (in mm) and morphometric ratios in *Roncus satoi* sp. nov., from Serbia, Yugoslavia. Abbreviations: trito. = tritonymph; TS = tactile seta.

Character	♀♀	♂♂	trito.
Body			
Length (1)	2.37 –2.45	2.14 –2.61	1.73
Cephalothorax			
Length (2)	0.59 –0.64	0.58 –0.69	0.50
Breadth	0.535–0.59	0.51 –0.58	0.42
Abdomen			
Length	1.78 –1.81	1.55 –1.97	1.23
Breadth	0.82 –0.86	0.69 –0.89	0.62
Chelicerae			
Length (3)	0.41 –0.425	0.37 –0.41	0.27
Breadth (4)	0.205–0.22	0.19 –0.21	0.15
Length of movable finger (5)	0.29 –0.30	0.26 –0.27	0.205
Length of galea	0.01	0.01	—
Pedipalps			
Length with coxa (6)	3.53 –3.535	3.105–3.325	2.265
Ratio 6/1	1.44 –1.49	1.20 –1.48	1.31
Length of coxa	0.55 –0.59	0.48 –0.53	0.36
Length of trochanter	0.425–0.52	0.36 –0.39	0.28
Length of femur (7)	0.68 –0.70	0.64 –0.68	0.48
Breadth of femur (8)	0.21 –0.23	0.17 –0.21	0.14
Ratio 7/8	2.96 –3.33	3.24 –3.85	3.43
Ratio 7/2	1.06 –1.19	0.985–1.15	0.96
Length of tibia (9)	0.55 –0.57	0.50 –0.60	0.36
Breadth of tibia (10)	0.24 –0.26	0.22 –0.25	0.16
Ratio 9/10	2.19 –2.29	2.125–2.40	2.25
Length of chela (11)	1.21 –1.27	1.09 –1.185	0.785
Breadth of chela (12)	0.39 –0.41	0.315–0.35	0.23
Ratio 11/12	3.10	3.385–3.61	3.41
Length of chelal palm (13)	0.59 –0.62	0.49 –0.535	0.385
Ratio 13/12	1.51	1.485–1.67	1.67
Length of chelal finger (14)	0.62 –0.65	0.60 –0.665	0.40
Ratio 14/13	1.05	1.14 –1.28	1.04
Leg IV			
Total length	2.27 –2.41	2.185–2.255	1.50
Length of coxa	0.37 –0.39	0.34 –0.38	0.28
Length of trochanter (15)	0.29 –0.31	0.26 –0.29	0.18
Breadth of trochanter (16)	0.14 –0.15	0.13 –0.14	0.11
Ratio 15/16	2.07	2.00 –2.03	1.64
Length of femur (17)	0.59 –0.63	0.55 –0.59	0.38
Breadth of femur (18)	0.205–0.23	0.195–0.23	0.15
Ratio 17/18	2.74 –2.88	2.565–2.92	2.53
Length of tibia (19)	0.51 –0.55	0.49 –0.52	0.34
Breadth of tibia (20)	0.11 –0.12	0.10 –0.11	0.075
Ratio 19/20	4.58 –4.64	4.64 –5.10	4.53
Length of basitarsus (21)	0.195–0.205	0.19 –0.205	0.12
Breadth of basitarsus (22)	0.085–0.09	0.08 –0.09	0.065
Ratio 21/22	2.28 –2.29	2.22 –2.44	1.85
Length of telotarsus (23)	0.315–0.325	0.31 –0.32	0.20
Breadth of telotarsus (24)	0.08	0.06 –0.08	0.06
Ratio 23/24	3.94 –4.06	3.94 –5.25	3.33
TS ratio–tibia IV	0.59 –0.61	0.53 –0.64	0.59
TS ratio–basitarsus IV	0.21 –0.22	0.19 –0.25	0.305
TS ratio–telotarsus IV	0.33 –0.37	0.36 –0.48	0.31

0.75 mm), by the leg IV length of males (2.185–2.255 mm *vs.* 2.385–2.70 mm), by the ratio of the telotarsus IV length to breadth of females (3.94–4.06 *vs.* 4.22–4.625), by the form of the chelal palm of females (almost globular *vs.* ovate), and by the body size (smaller *vs.* greater).

From its phenetically most similar species, *R. strahor* ČURČIĆ, 1993, from southeastern Serbia, *R. satoi* sp. nov. differs in the intensity of granulation on the pedipalpal chelae (inconspicuous *vs.* well-developed), in the presence/absence of exterior and dorsal granulations of the pedipalpal chelae (absent *vs.* present), in the form of the pedipalpal femur of males (with almost parallel sides *vs.* with convex interior side), and in the number of teeth on the fixed chelal finger of males (51–54 *vs.* 56–61).

In lieu of a conclusion. The existence of 15 species of *Roncus* in Serbia (Yugoslavia) supports the fact that the taxonomy of this genus is still far from being complete. The variety of both cavernicolous and epigean species of *Roncus*, described elsewhere (ČURČIĆ *et al.*, 1994), offers further proof that this genus is presently subjected to intensive radiation into new species. Additionally, the diversity of *Roncus* representatives in the Balkan regions bordering on Serbia, compared to the same feature in other areas, points to the Balkan Peninsula as a centre of origin and genesis of numerous forms of the genus (ČURČIĆ *et al.*, 1993). Furthermore, the occurrence of numerous *Roncus* species with extremely limited distribution areas demonstrates their endemic nature (ČURČIĆ *et al.*, 1994).

With regard to the presence or absence of microsetae proximal to the trichobothria *eb* and *esb*, it should be noted that this feature is present in *R. pannonius*, *R. trojan*, *R. strahor*, and *R. satoi* sp. nov., and virtually absent in all other *Roncus* species from Serbia (Yugoslavia). It is suggested that the presence of this character might be useful in distinguishing representatives of two species groups: “*R. lubricus*” (microsetae present) and “*R. parablothroides* HADŽI, 1937” (microsetae absent) (ČURČIĆ *et al.*, 1993). In *R. pannonius* and *R. satoi* sp. nov., these microsetae are present in adults, but in tritonymph their number is variable (0–2 in *R. pannonius*, none in *R. satoi* sp. nov.). Furthermore, it is not yet known whether this character is present or absent in either deutonymphs or protonymphs. Therefore, much more remains to be learned about the postembryonic development of this morphological feature before we can judge precisely its taxonomic value in delimiting species and species groups of *Roncus*.

Last, but not the least, the present knowledge of the geographical distribution of this character does not permit as yet precise conclusion on the exact distribution patterns of the species (or species groups) of *Roncus*, beset with or deprived of tiny microsetae proximal to the trichobothria *eb* and *esb* (ČURČIĆ *et al.*, 1994).

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